EQUINOX

SuperSerial™ Technology

Hardware Installation & Reference Manual

Megaport SS Serial I/O Board Series

Notice

FCC Notice

The equipment has been tested and found to comply with the limits for Class A digital devices, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Megaport SS, Serial I/O Board Series, Hardware Manual
560092/B (March 1996)

Manual Organization

This manual is comprised of three chapters and one appendix.

Chapter 1. Overview

This chapter describes the Equinox family of Megaport SS Boards.

Chapter 2. Installation

Chapter 2 describes the Megaport SS Board installation.

Chapter 3. Port to Device Cabling

The Megaport SS Boards support a wide variety of terminals, printers and modems. Chapter 3 describes the SSM cabling options.

Appendix A. Support Procedures

Appendix A describes the steps you would follow to receive technical support and to report problems with this documentation.

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**Megaport SS
Serial I/O Board
Series**

EQUINOX

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1 Overview

Equinox Megaport SS Boards are intelligent, high-speed (up to 115K bps) *multiport boards* providing high performance serial I/O solutions for ISA, EISA and Micro Channel bus systems. All port interfaces are standard RS-232 with modem control and voltage surge protection.

Megaport SS Boards

The Megaport SS Board (shown in Figure 1-1) occupies a slot in the host computer and provide the intelligent functions to "off-load" the CPU serial communications processing tasks. Boards are available for ISA, EISA and Micro Channel bus systems and are compatible with operating systems using UNIX and LAN applications. Table 1-1 lists the various models and characteristics of the Megaport SST Boards available from Equinox.
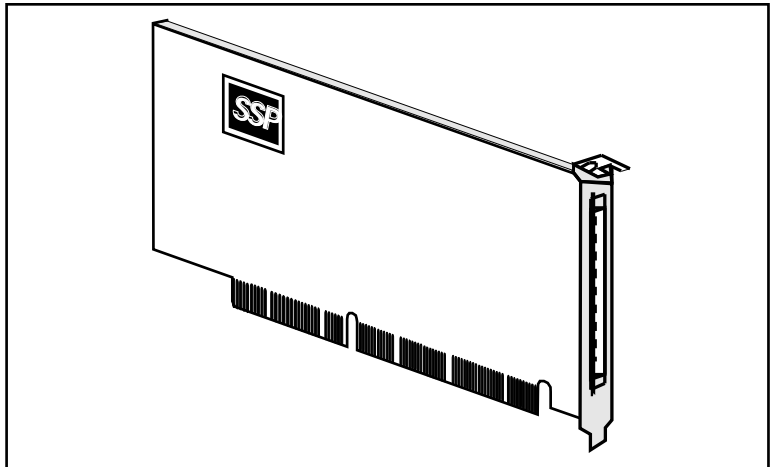
Figure 1-1. Megaport SS Board

PART NUMBER	MODEL	BUS Type	Ports
950267	SSM-8I	ISA	8
950242	SSM-12I	ISA	12
950241	SSM-24I	ISA	24
950244	SSM-12E	EISA	12
950243	SSM-24E	EISA	24
950246	SSM-12M	Micro Channel	12
950245	SSM-24M	Micro Channel	24

Table 1-1. Megaport SS Boards

Software Driver

All Megaport SS Boards include a software driver diskette and installation manual. EISA and Micro Channel machines must run their setup utility whenever a board is added or removed from the computer. See your system documentation on how to run these utilities. Equinox EISA .cfg and Micro Channel .adf files can be found in the root directory of the *Equinox SST DOS Diagnostic and Configuration Software for UNIX based systems* diskette.

Adapter Cable

Included with each Megaport 12/24 SS Board is an adapter cable. The adaptor cable is connected to the board and terminates with one or two 50-pin telco connector (illustrated in Figure 1-2). These connectors are attached to any one of a variety of splitters and distribution panels for device connection. The cable used with Model SSM-12 Megaport boards terminates with one telco connector providing port connections for up to 12 devices. The cable used with Model SSM-24 Megaport Boards terminates with two telco connectors and provides port connections for up to 24 devices.

Cable used with
SSM-12
Megaport Board
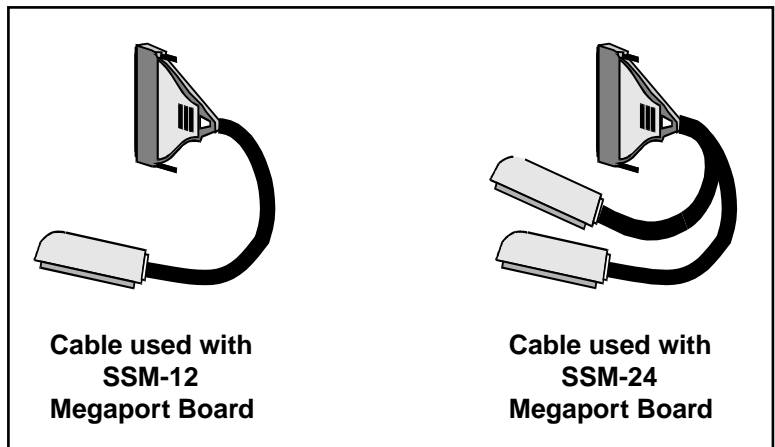
Cable used with
SSM-24
Megaport Board

Figure 1-2. Cable used with SSM-12 and SSM-24 Megaport Boards

The Megaport SSM-8 board has eight 6-wire RJ-11 connectors on the back of the board.

Differences in Megaport SS vs Megaport CS

Feature	Megaport SS	Megaport 8/12/24 CS
Maximum Speed	115.2 kbps	38.4 kbps
Voltage Surge Protection	Yes	No
OS/2 Driver Support	No	Yes
AIX Driver Support	No	Yes
Solaris Driver Support	No	Yes
QNX Driver Support	No	Yes
UNIX ISA Auto Install	Yes	No
ISA Memory Requirements	16 K bytes	8 K + 8 K / Board
ISA I/O Address Configuration	DIP Switch	Header Strap
Control Signal Borrowing	No	Yes
DOS Diagnostics	Yes	No
Warranty	5 Years	3 Years

Table 2-2. Megaport SS to Megaport CS Comparison

See Table 2-2 above for differences between Megaport SS and Megaport CS serial I/O adapter cards. Note that the Equinox Megaport SS product line supports device drivers that the Megaport CS product line does not. Contact Equinox sales or your Equinox reseller for more details.

The system requirements for ISA, EISA and Micro Channel Platforms are discussed in this chapter.

Megaport SS Boards appear to the system host processor as memory. That is, they are memory mapped devices. Each board is automatically mapped into system memory at the time of device driver installation. The device driver soft-configures all boards each time the system is initialized (booted).

Assigning the ISA I/O Base Address

This section discusses the I/O address requirements for the Megaport SS Board installed in an ISA system. (EISA and Micro Channel system memory requirements are discussed later in this chapter.)

The ISA Megaport SS Board (shown in Figure 2-1) must be assigned a unique I/O base address. If multiple ISA boards are installed in the same system, a different address must be assigned to each board. This procedure should be performed before the board is physically installed.
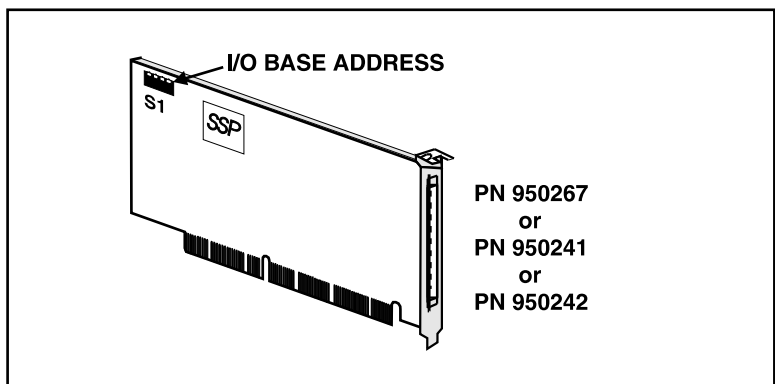
Figure 2-1. DIP switch location on ISA Megaport SS Board

S1 - Top View

ISA Adapter Card

1	2	3	4	BASE ADDRESS
OFF	OFF	OFF	OFF	200
ON	OFF	OFF	OFF	220
OFF	ON	OFF	OFF	240
ON	ON	OFF	OFF	260
OFF	OFF	ON	OFF	280
ON	OFF	ON	OFF	2A0
OFF	ON	ON	OFF	2C0
ON	ON	ON	OFF	2E0
OFF	OFF	OFF	ON	300
ON	OFF	OFF	ON	320
OFF	ON	OFF	ON	340
ON	ON	OFF	ON	360
OFF	OFF	ON	ON	380
ON	OFF	ON	ON	3A0
OFF	ON	ON	ON	3C0
ON	ON	ON	ON	3E0

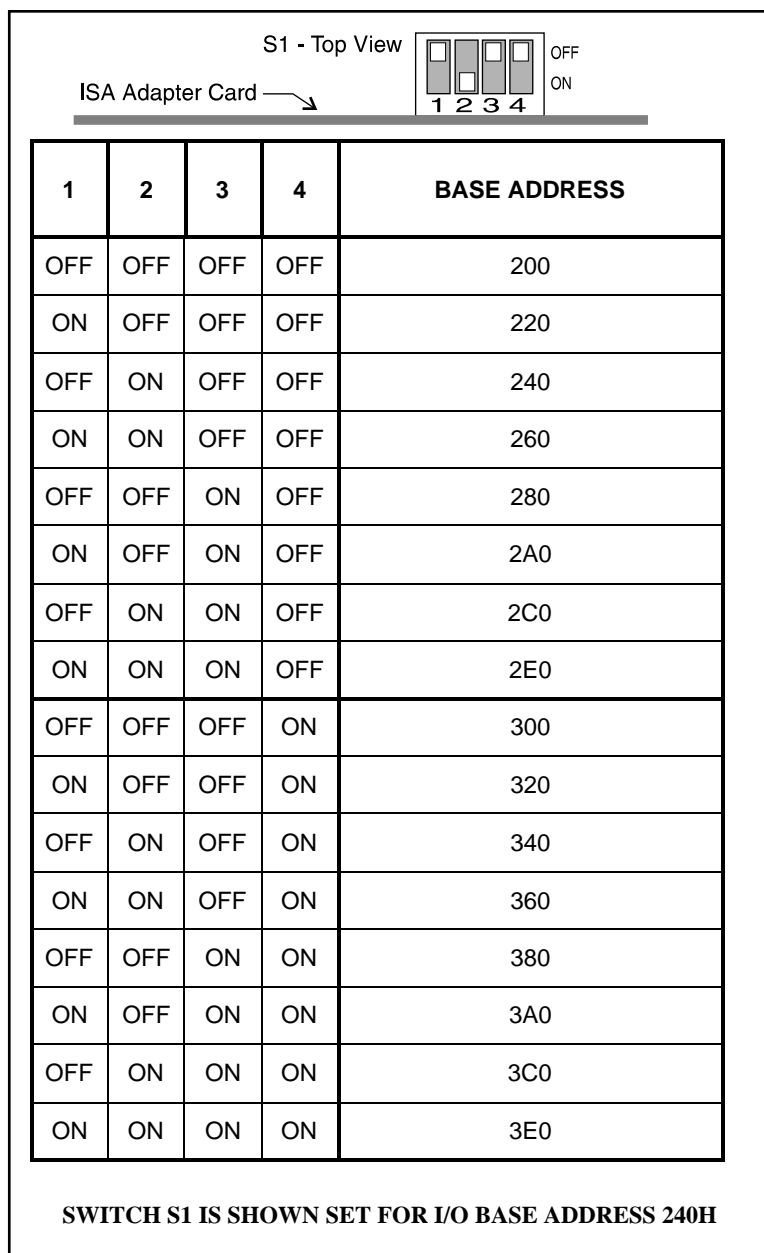**SWITCH S1 IS SHOWN SET FOR I/O BASE ADDRESS 240H**

Figure 2-2. ISA I/O Base Address Selections

Select a unique I/O base address from the list in Figure 2-2 for the ISA host controller board. Assign the I/O base address by setting S1 (DIP switch shown in Figure 2-1) to the selected address.

If you select an address that is invalid, simply shutdown your system and select another address. It is not necessary to reinstall the software driver after changing the I/O addresses.

Address Log

You may need to refer to the I/O base address assigned to the board(s) when installing the driver. Write the selected address for each board installed in your system in the following table.

I/O Base Address Log
1._____   2._____   3._____   4._____
5._____   6._____   7._____   8._____

Board Installation

Use the following procedure to install your Megaport SS Board. Alternatively, you may follow the installation instructions presented in your host system documentation.

1. Set the host computer system power switch to OFF and disconnect the power cord.
2. Locate a free expansion slot.
3. Insert and secure the board firmly into the expansion slot.
4. Replace the power cord and turn the host computer system ON.

EISA System Setup

The EISA Configuration Utility that came with your computer reserves system resources for each board (subsystem) that is installed. This resource information is stored in the EISA system CMOS. When your system boots, the Equinox software driver will read the assigned board information directly from the CMOS configuration. Following is a general discussion on using this system utility, you should consult your host documentation for specific procedures for your system.

EISA Configuration Diskette

System resources for EISA boards are allocated by a menu-driven program provided by your computer system vendor. Usually there is a bootable floppy disk called the Configuration Diskette which must be run whenever a board is added or removed from the system. Each third party board vendor (such as Equinox) supplies a database of configuration information containing a list of system resources which the board requires. The configuration (**.cfg**) files are located in the root directory of the *DOS Diagnostics and Configuration Software For UNIX Systems* diskette. When configuring the system you are asked to put this diskette into the floppy drive so that the database information can be copied onto the system disk for later use. Follow the procedures in your system documentation for the use of this utility. (If you are also installing an ISA board see the beginning of this chapter for details on ISA I/O requirements.)

You need not be overly concerned with selecting valid address blocks because the EISA configuration program is designed to make sure there are no conflicts over system resources.

Micro Channel System Setup

The Micro Channel Setup Utility that came with your computer reserves system resources for each board (subsystem) that is installed. This resource information is stored in the Micro Channel system CMOS. When your system boots, the Equinox software driver will read the assigned board information directly from the Micro Channel CMOS configuration. Following is a general discussion on using this system utility, you should consult your host documentation for specific procedures for your system.

Micro Channel Reference Diskette

System resources for Micro Channel adapters are resolved by a menu-driven program provided by your computer system vendor. Usually there is a bootable floppy disk called the Reference Diskette which must be run whenever a board is added or removed from the system. Each third party board vendor (such as Equinox) supplies an Option Diskette containing a database of required system resources. The first time you turn on the machine with the board installed, an error code appears and 2 beeps sound after the RAM is counted. This error message indicates a configuration change was performed and the machine must be reconfigured to recognize the SSM board(s).

Micro Channel machines require an Adapter Description File (.**adf**) to automatically configure each board (adapter) installed. The system identifies the adaptor by requesting a Programmable Option Select (POS) ID from adapters installed in the computer. The POS ID for the boards is 638A. The corresponding adf files (@638A.adf) for the SSM Boards containing the configuration information are located in the root directory of the *DOS Diagnostics and Configuration Software For UNIX Systems* diskette. When configuring the system you are asked to put this Option Diskette into the floppy drive so that the database can be copied onto the system Diskette for later use. Follow the procedures in your system documentation for the use of this utility.

Installing the Adaptor Cable

Connect the adaptor cable to the Megaport SS Board connector as follows:

1. Locate the 100-pin female connector on the Megaport SS Board.

2. Notice that the 100-pin cable connector is keyed such that it can only attach to the board in one orientation. With the cable properly oriented, insert the 100-pin male cable connector into the female Megaport SS Board connector and press firmly.

Equinox Wiring Accessories

3. Tighten the screws to hold the cable securely to the board.

Equinox wiring accessories convert the 50-pin telco terminating connector(s) to DB-25 or RJ-11 modular jacks for distribution of ports to external devices such as terminals, modems and printers. Telco pinouts and wiring diagrams for the Megaport SS Board accessories are found in Chapter 3, *Cabling Devices To Ports.*

Equinox 25-pair extension cables may be used to extend the distance from the cable attached to the Megaport SS Board to the cabling accessories. These cables plug into distribution panels, punch blocks, fan-out cables and modular splitters. Extension cables in various lengths are available from Equinox.

3 Port to Device Cabling

This chapter describes the options available for cabling devices to ports connected to Megaport SS Boards (see Figure 3-1). These ports provide a standard RS-232 interface with modem control signals.
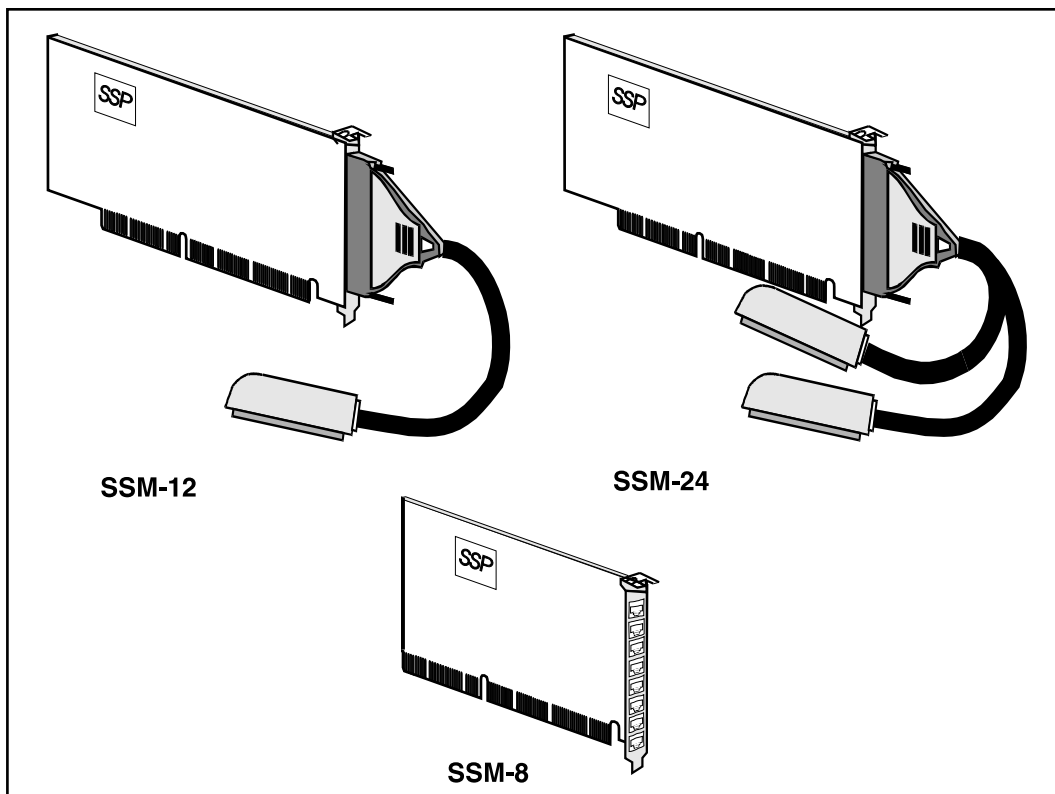

Figure 3-1. SSM-8, SSM-12 and SSM-24 Megaport SS Boards

Port Signal Names

To assist in wiring the SSM- Megaport board, Equinox sells a complete set of cabling accessories. See an *Equinox Ordering Guide* for more information.

The names of signals on the telco connectors of the Megaport ports indicate the direction of the signals. They are either *inbound* (received by the Megaport board) or *outbound* (transmitted from the Megaport board).

Data Signals

The following names are used for data signals:

DATA IN indicates data received by the Megaport SS board from the attached device (inbound).

DATA OUT indicates data transmitted from the Megaport SS board to the attached device (outbound).

EIA Control Signals

The following names are used for modem control signals:

CNTL IN indicates the control signal received by the Megaport SS board (inbound).

CNTL OUT indicates the control signal transmitted from the Megaport SS board (outbound).

Conversion to RS-232 Signal Names

The conversion to RS-232 from the Megaport telco pinouts and signal names (DATA IN, DATA OUT, CNTL IN and CNTL OUT) is accomplished by using Equinox modular adaptors and/or RS-232 distribution panels. The information below should assist in selecting the correct modular adaptor for the particular application.

Telco Connector Pinouts

This part of Chapter 3 lists the cable pinouts of the ports. The physical ports are mapped by the device driver into UNIX/XENIX tty device names.

SSM-8 Megaport Board Pinouts

Port one is the upper most port on the back of the SSM-8. See Figure 3-9 for RS232 pinout information.

SSM-12 Megaport Board Telco Connector Pinouts

Figure 3-2 shows the wiring of the telco connector on the SSM-12 Megaport Board. A single cable provides all the signals required for supporting 12 ports.
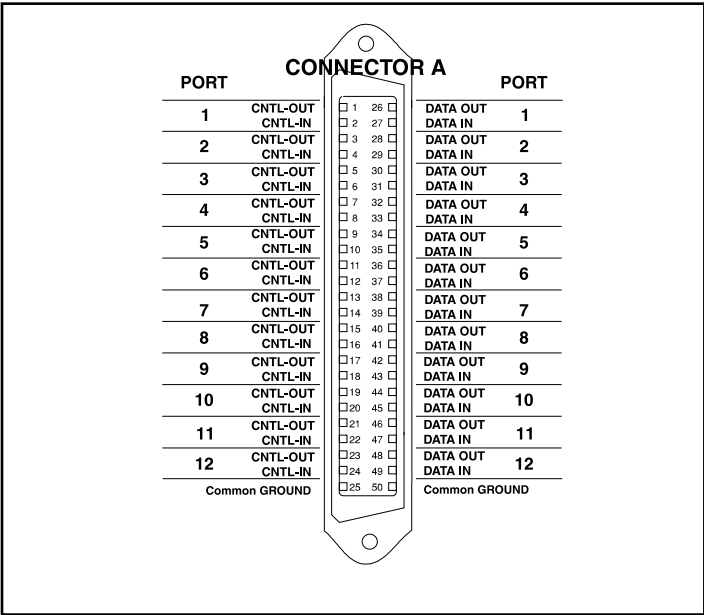

Figure 3-2. SSM-12 Megaport Board telco connector pinouts

SSM-24 Megaport Board Telco Connector Pinouts

The wiring of the telco connectors on the SSM-24 Megaport Board is shown in Figure 3-3. Connector A provides ports 1-12 and is identical to the SSM-12 connector. Connector B provides ports 13-24. Various accessories may be used to connect devices to Megaport SS ports. The two primary wiring methods are: DB-25 wiring and modular wiring.

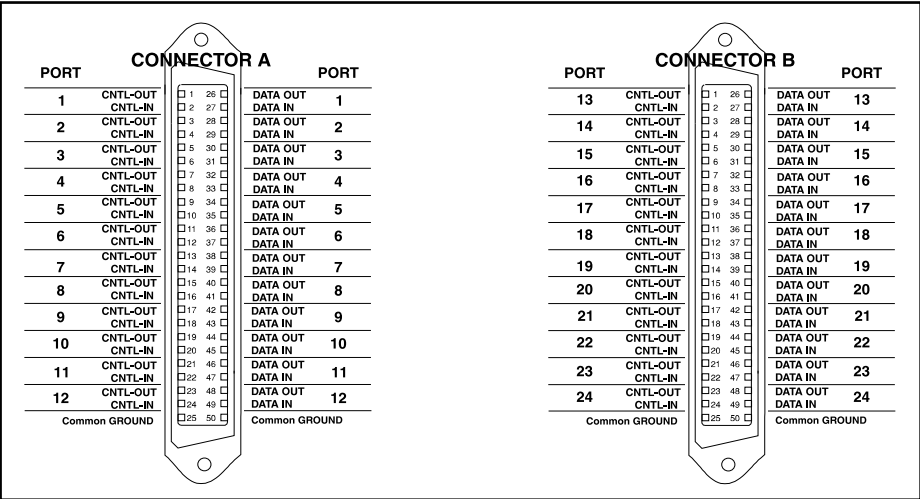*Figure 3-3. SSM- 24 Megaport Board telco connector pinouts*

Wiring to Terminal Devices

DB-25 Wiring

DB-25 distribution panels are used to convert 50-pin connectors to DB-25 RS-232 connectors (see Figure 3-4).
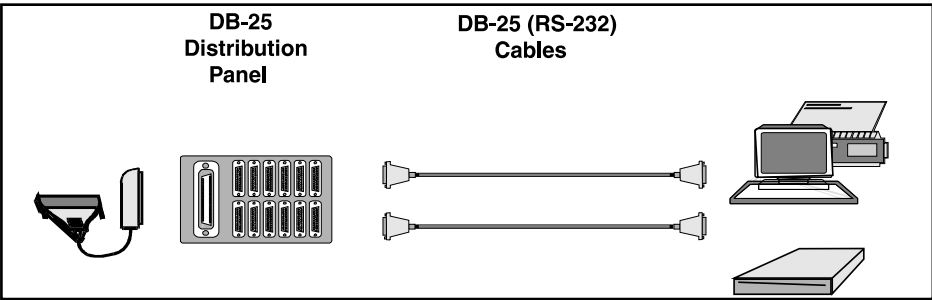
Figure 3-4. DB-25 cable wiring

Modular Wiring

Modular splitters are used with modular adaptors and modular cables to connect devices to the board (see Figure 3-5).

Modular adaptors and cables are used for attaching devices to the selected cabling option (see Figures 3-5 and 3-6).
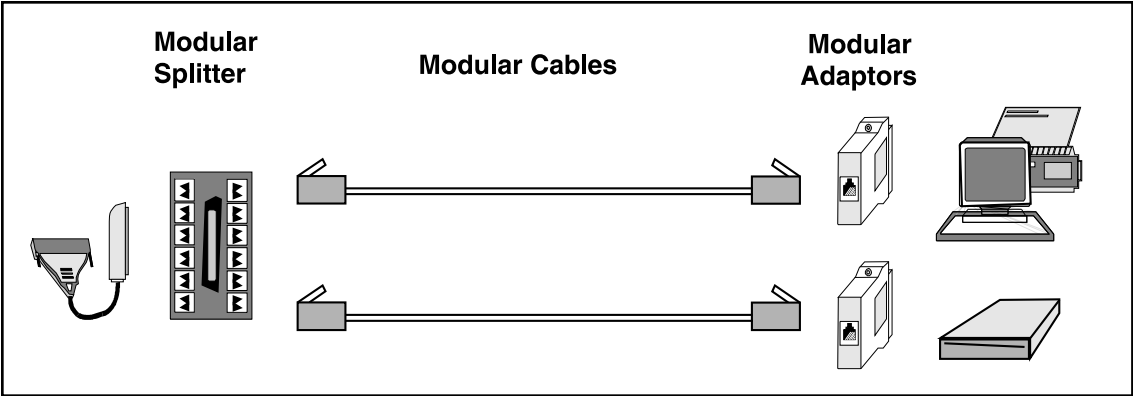
Figure 3-5. Modular cable wiring

Punch blocks may also be used with modular wall outlets and other modular accessories (see Figure 3-6).
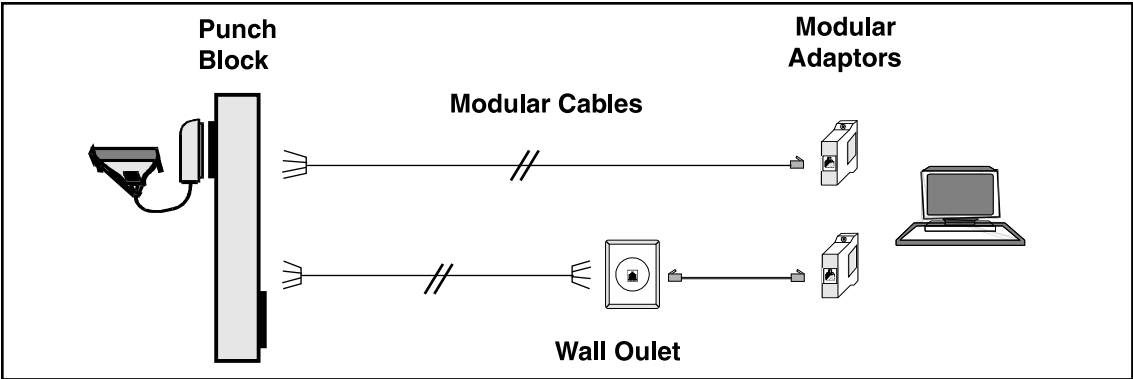
Figure 3-6. Punch block modular cable wiring

DB-25 Wiring

DB-25 Distribution Panels

Distribution panels convert 50-pin connectors to twelve DB-25 RS-232 connectors (see Figure 3-4). One distribution panel or fan-out cable is required for 12 devices. Two are required for 24 ports.

The following distribution panels are available from Equinox:

Part No.	DB-25 Connector	Connect To
990117	12 DCE female	terminals and DTE devices
990121	12 DTE male	modems
990122	12 DTE female	male DCE devices

Distribution Panel Internal Wiring

Figures 3-7 and 3-8 illustrate the internal wiring for both DCE and DTE distribution panels, respectively.

Figure 3-7. Internal wiring for DCE distribution panels

```
┌─────────────────────────────────────────────────────────┐
│                                      To DCE Device       │
│    50-pin Connector                  RS-232 Connector     │
│                                                           │
│    DATA IN       ◄──────────────────────  RxD  (3)        │
│    DATA OUT      ──────────────────────►  TxD  (2)        │
│    Ground        ───────────────────────  Gnd  (7)        │
│    CNTL-IN       ◄──────────────────────  DCD  (8)        │
│    CNTL-OUT      ─────────────────────●─► RTS  (4)        │
│                                        └──► DTR  (20)      │
└─────────────────────────────────────────────────────────┘
```
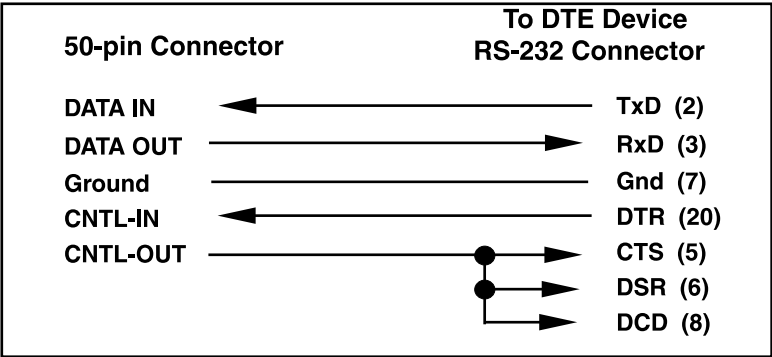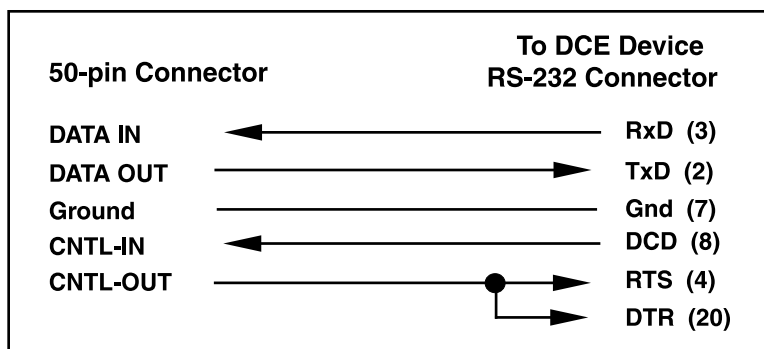
Figure 3-8. Internal wiring for DTE distribution panels

Modular Wiring

Modular Splitter

Modular splitters are used with modular adaptors and modular cable. Modular splitters convert the 50-pin connector to a set of 12 modular jacks. Figure 3-5 illustrates devices connected to the Megaport using the modular splitter.

● The modular splitter (Equinox part number 210016) converts the signals on the 50-pin connector to 12 RJ-11 modular jacks. (Two modular splitters are required to connect 24-devices.) This splitter should be used to connect to ports only.

● Either 4 or 6-wire modular cable may be used to attach devices to the splitter. The outer two wires which support control signals are omitted when using 4-wire cables. Standard modular cables used for telephones are always reversing (e.g. pin 1 is connected to pin 4, etc.) and are typically 4-wire. If a user supplied modular cable is used, make sure the cable is reversing (see paragraph heading *Modular Cables*).

● Modular adaptors convert modular jacks at the end of modular cables to DB-25 RS-232 connectors. One adaptor for each device to be connected is required.

The modular splitter is wired as shown in Figure 3-9. Signal names shown refer to those present on the telco connector.
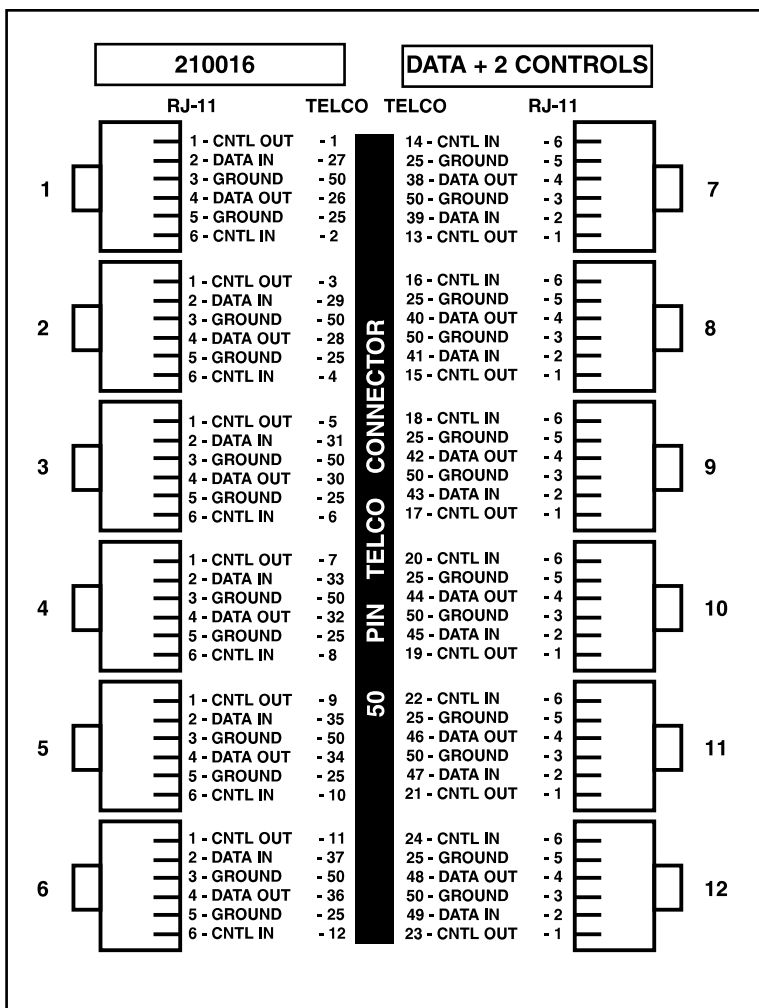
210016				DATA + 2 CONTROLS		
	RJ-11	TELCO		TELCO		RJ-11
1	1 - CNTL OUT	- 1		14 - CNTL IN	- 6	**7**
	2 - DATA IN	- 27		25 - GROUND	- 5	
	3 - GROUND	- 50		38 - DATA OUT	- 4	
	4 - DATA OUT	- 26		50 - GROUND	- 3	
	5 - GROUND	- 25		39 - DATA IN	- 2	
	6 - CNTL IN	- 2		13 - CNTL OUT	- 1	
2	1 - CNTL OUT	- 3		16 - CNTL IN	- 6	**8**
	2 - DATA IN	- 29		25 - GROUND	- 5	
	3 - GROUND	- 50		40 - DATA OUT	- 4	
	4 - DATA OUT	- 28		50 - GROUND	- 3	
	5 - GROUND	- 25		41 - DATA IN	- 2	
	6 - CNTL IN	- 4		15 - CNTL OUT	- 1	
3	1 - CNTL OUT	- 5		18 - CNTL IN	- 6	**9**
	2 - DATA IN	- 31		25 - GROUND	- 5	
	3 - GROUND	- 50		42 - DATA OUT	- 4	
	4 - DATA OUT	- 30		50 - GROUND	- 3	
	5 - GROUND	- 25		43 - DATA IN	- 2	
	6 - CNTL IN	- 6		17 - CNTL OUT	- 1	
4	1 - CNTL OUT	- 7		20 - CNTL IN	- 6	**10**
	2 - DATA IN	- 33		25 - GROUND	- 5	
	3 - GROUND	- 50		44 - DATA OUT	- 4	
	4 - DATA OUT	- 32		50 - GROUND	- 3	
	5 - GROUND	- 25		45 - DATA IN	- 2	
	6 - CNTL IN	- 8		19 - CNTL OUT	- 1	
5	1 - CNTL OUT	- 9		22 - CNTL IN	- 6	**11**
	2 - DATA IN	- 35		25 - GROUND	- 5	
	3 - GROUND	- 50		46 - DATA OUT	- 4	
	4 - DATA OUT	- 34		50 - GROUND	- 3	
	5 - GROUND	- 25		47 - DATA IN	- 2	
	6 - CNTL IN	- 10		21 - CNTL OUT	- 1	
6	1 - CNTL OUT	- 11		24 - CNTL IN	- 6	**12**
	2 - DATA IN	- 37		25 - GROUND	- 5	
	3 - GROUND	- 50		48 - DATA OUT	- 4	
	4 - DATA OUT	- 36		50 - GROUND	- 3	
	5 - GROUND	- 25		49 - DATA IN	- 2	
	6 - CNTL IN	- 12		23 - CNTL OUT	- 1	

(center column: 50 PIN TELCO CONNECTOR)

Figure 3-9.   Modular splitter wiring

☞ SSM-8 ports are wired the same as shown above for ports 1 through 8.

Modular Cables

RJ-11 modular cable is the flat cable used for wiring telephones inside of buildings. The cable is terminated at each end with a RJ-11 modular plug (connector). This plug is inserted into the modular jack of an appropriate wiring module. Standard modular cables, available from Equinox or wiring distributors, are reversing. That is, the pins are reversed on each end so that pin 1 on one end is connected to pin 6 on the opposite end (pin 2 is connected to pin 5, etc). Figure 3-10 illustrates the signals passed through modular cables when connected to a port using the Equinox part number 210016 modular splitter.
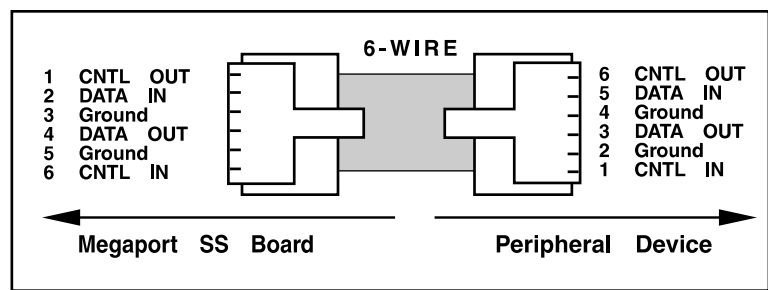
Figure 3-10. Modular cable signals

Modular Adaptors

Modular adaptors (see Figure 3-11) convert modular jacks to DB-25 or DB-9 connectors. The following list describes the modular adaptors available from Equinox. This list may be used to determine the correct modular wiring accessories required for system installation.

Part No.	Connector	Connect To
210036	DB-25 DCE male	terminals or ports (female DTE)
210037	DB-25 DCE female	terminals, ports, etc.
210026	DB-25 DTE male	modems or multiplexer channels (female DCE)
210027	DB-25 DTE female	Male DCE devices (nonstandard devices)
210038	DB-9 female	PC serial port

FOR TERMINALS & PRINTERS:
210036 [DB-25 DCE Male]
210037 [DB-25 DCE Female]

SIGNAL	RJ-11		DB-25	
DATA IN	5		2	TD
DATA OUT	3		3	RD
Gnd	4		7	Gnd
Gnd	2			
CNTL OUT	6		5	CTS
		3K	6	DSR
			8	DCD
CNTL IN	1		20	DTR
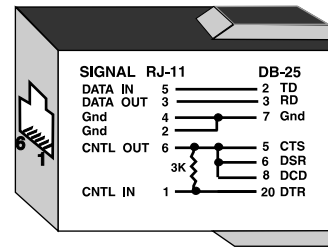
FOR MODEMS:
210026 [DB-25 DTE Male]
210027 [DB-25 DTE Female]

SIGNAL	RJ-11		DB-25	
DATA OUT	3		2	TD
DATA IN	5		3	RD
Gnd	4		7	Gnd
Gnd	2			
CNTL IN	1		8	DCD
			4	RTS
		3K		
			6	DSR
CNTL OUT	6		20	DTR
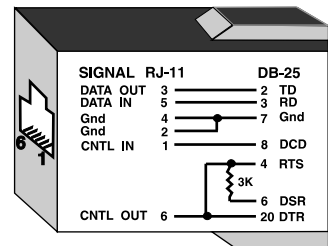
FOR PERSONAL COMPUTERS:
210038 [DB-9 Female]

SIGNAL	RJ-11		DB-9	
DATA OUT	3		2	TD
DATA IN	5		3	RD
Gnd	2		5	Gnd
Gnd	4			
			1	DCD
			6	DSR
CNTL OUT	6		8	CTS
CNTL IN	1		4	DTR
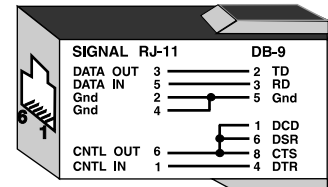
Figure 3-11.   Modular adaptors

☞ When making modular adaptors, the 3K resistor shown in Figure 3-11 may be eliminated for use with most terminals. The resistor is used to loop control signals back to the attached device when 4-wire cable is used and pin 6 is not connected. When using 6-wire cable and there is a voltage on pin 6, the resistor has no effect and the voltage on pin 6 is passed through to the attached device.

Punch Blocks

Punch blocks provide a quick and inexpensive solution to wiring around buildings. They may be concealed in wiring closets and individual wires run to each location where a terminal or port is to be connected. Punch blocks may be used with modular wall outlets and wiring accessories.

Figure 3-6 illustrates connecting the Megaport SS board to punch blocks using modular adaptors and modular wall outlets. Wall outlets
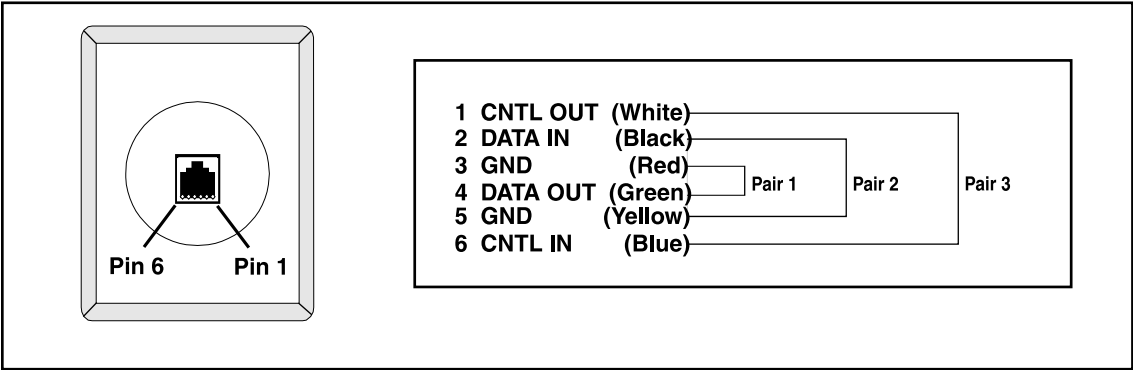


```
         1  CNTL OUT  (White)
         2  DATA IN     (Black)
         3  GND             (Red)
         4  DATA OUT  (Green)    Pair 1     Pair 2     Pair 3
         5  GND         (Yellow)
         6  CNTL IN      (Blue)
```

Pin 6   Pin 1

Figure 3-12. Modular wall outlet wiring

should be wired as shown in Figure 3-12.
Figure 3-13 shows the pinouts for the Equinox part number 210044 punch block when connected to a Megaport SS board.

☞

The punch block has two 50-pin PBX connectors and connects 24 ports. Also, the punch block has an internal common ground wired to the center two rows of pins. Any of these pins may be used for connecting terminal ground to the port.
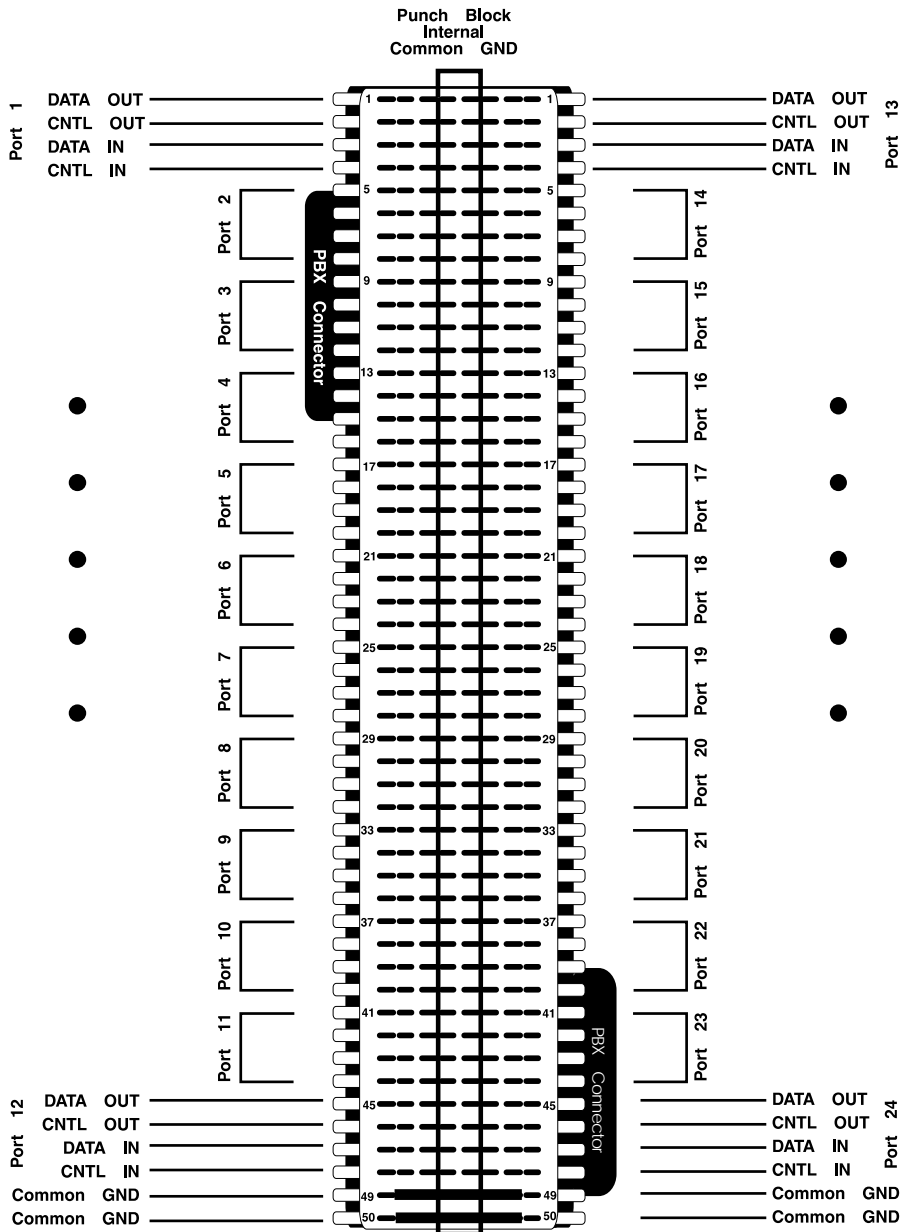
Figure 3-13. Punch block (PN 210044) wiring

Equinox Megaport SS Board Series Hardware Manual

A Support Procedures

SuperSerial™ Technology

Technical Support Procedures

Equinox systems has made every effort to ensure that your Megaport SuperSerial Technology Board is of top quality in all respects. If you have a problem, please follow these steps:

1. Read the appropriate hardware and software manuals and any release notes which describe the procedure you are trying to perform.

2. Check the Equinox Bulletin Board. To access the board, call (954) 746-0282 with any speed modem using N-8-1 as the communications parameters.

3. Contact the distributor from whom you purchased the board. Equinox authorized distributors are fully trained on SuperSerial Port products and are authorized to handle technical support, service, returns and warranty claims.

4. If you still need assistance after calling your distributor or other point of purchase, call Equinox Technical Support at (954) 746-9000. You can also send problem reports, bug reports and questions to our fax number: (954) 746-9101 or e-mail address: support@equinox.com. Please have the following information available when you place your call:

    Board Type:
    Serial Number:
    Date of Purchase:
    Place of Purchase:
    Operating System:
    Operating System Version:
    Device Driver Version:
    Computer Make & Model:
    Other Boards in Machine:
    Description of Problem:

Documentation Support Procedures

At Equinox we are always striving to make our product manuals accurate and easy to read. If you have an improvement to suggest or find an error in this manual please let us know.

Manual

Megaport SS Board Series, Hardware Manual, (560092/B)

Operating System/ Version

_____

Driver Version

_____

Problem

_____

_____

Solution

_____

_____

What could be added or changed to make the manual better?

_____

_____

Your Name: _____   Title: _____

Company: _____   Phone: _____

_____   _____

Send to: Equinox Systems Inc.
            ATTN: Customer Service
            One Equinox Way
            Sunrise, Florida 33351-6709
      Phone: 954-746-9000   Fax: 954-746-9101

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